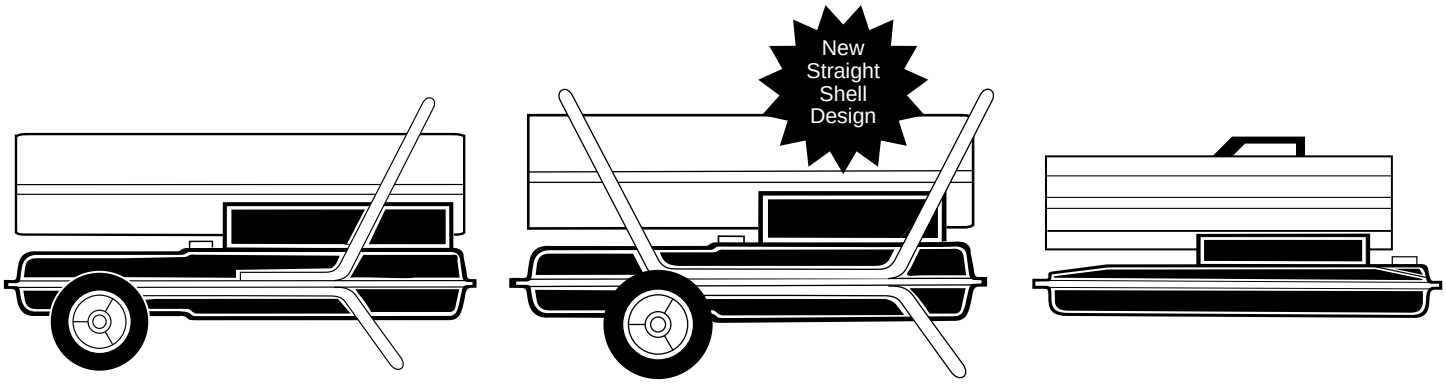
DESA™
HEATING PRODUCTS

KEROSENE/DIESEL PORTABLE FORCED AIR HEATERS

OWNER'S MANUAL

For more information, visit www.desatech.com



Heater Sizes: 40,000 55,000 60,000 70,000 110,000 115,000 155,000 165,000 and 200,000 Btu/Hr Models

H.S.I. Series

IMPORTANT: Read and understand this manual before assembling, starting or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

TABLE OF CONTENTS

SAFETY INFORMATION 2
PRODUCT IDENTIFICATION 3
UNPACKING 3
THEORY OF OPERATION 4
FUELS 4
VENTILATION 4
ASSEMBLY 5
OPERATION 5
OPERATION WITH PORTABLE GENERATOR 6
STORING, TRANSPORTING, OR SHIPPING 6
PREVENTATIVE MAINTENANCE SCHEDULE 6
TROUBLESHOOTING 7
SERVICE PROCEDURES 8
TECHNICAL SERVICE 15
REPLACEMENT PARTS 15
SPECIFICATIONS 16
WIRING DIAGRAMS 16
ILLUSTRATED PARTS BREAKDOWN AND PARTS LIST 18
WHEELS AND HANDLES 24
ACCESSORIES 25
OWNER'S REGISTRATION FORM 27
WARRANTY AND REPAIR SERVICE ..... Back Cover

Fill In For Your Records

Model No. _____
(Located on side panel)

Serial No. _____
(Located on fuel tank)

Date of Purchase: _____

ARL®

Save this manual for future reference. DESA

SAFETY INFORMATION

⚠ WARNINGS

⚠ WARNING: This product contains and/or generates chemicals known to the State of California to cause cancer or birth defects, or other reproductive harm.

IMPORTANT: Read this owner's manual carefully and completely before trying to assemble, operate, or service this heater. Improper use of this heater can cause serious injury or death from burns, fire, explosion, electrical shock, and carbon monoxide poisoning.

⚠ DANGER: Carbon monoxide poisoning may lead to death!

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

Make certain you read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

- Use only kerosene, #1#2 diesel/fuel oil, JET A or JP-8 fuels to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.
- Fueling
  a) Personnel involved with fueling shall be qualified and thoroughly familiar with the manufacturer's instructions and applicable regulations regarding the safe fueling of heating units.
  b) Only the type of fuel specified on the heater's data plate shall be used.
  c) All flame, including the pilot light, if any, shall be extinguished and the heater allowed to cool, prior to fueling.
  d) During fueling, all fuel lines and fuel-line connections shall be inspected for leaks. Any leaks shall be repaired prior to returning the heater to service.
  e) At no time shall more than one day's supply of heater fuel be stored inside a building in the vicinity of the heater. Bulk fuel storage shall be outside the structure.
  f) All fuel storage shall be located a minimum of 762cm (25 feet) from heaters, torches, welding equipment, and similar sources of ignition (exception: the fuel reservoir integral with the heater unit).
  g) Whenever possible, fuel storage shall be confined to areas where floor penetrations do not permit fuel to drip onto or be ignited by a fire at lower elevation.
  h) Fuel storage shall be in accordance with the authority having jurisdiction.
- Use only the electrical voltage and frequency specified on model plate.
- Heater must be grounded. Use only a properly grounded three-wire extension cord. Plug into grounded outlet only.
- Use only in areas free of flammable vapors or high dust content.
- Minimum clearance from any combustible materials: 8 feet (244 cm) from hot air outlet; 4 feet (122 cm) from top; and 4 feet (122 cm) from sides and inlet.
- Locate heater on a stable and level surface while hot or operating or a fire may occur.
- Use only in well-vented areas. Before using heater, provide at least a 2800 square cm (three-square-foot) opening of fresh, outside air for each 30 kw (100,000 Btu/Hr) of rating.
- Keep children and animals away from heater at all times.
- Never start heater when combustion chamber is hot or if fuel has accumulated in combustion chamber.
- When used with thermostat, heater may start at anytime.
- When heater is moved or stored, it must be in a level position or fuel spillage may occur.
- Use heater only in accordance with local ordinances and codes.
- Never use gasoline, crankcase drainings, naphtha, paint thinners, alcohol, or other highly flammable fuels.
- Never use heater where gasoline, paint thinner, or other highly flammable vapors are present.
- Never use heater in living or sleeping areas.
- Never leave a heater plugged in without adult supervision if children or animals are likely to be present.
- Never move, handle, refuel, or service a hot, operating, or plugged-in heater.
- Never attach duct work to front or rear of heater.
- Never attach heater to external fuel tank.
- Heaters used in the vicinity of tarpaulins, canvas, or similar enclosure materials shall be located a safe distance from such materials. The recommended minimum safe distance is 304.8cm (10 feet). It is further recommended that these enclosure materials be of a fire retardant nature. These enclosure materials shall be securely fastened to prevent them from igniting or from upsetting the heater due to wind action.
- Unplug heater when not in use.
- Never block air inlet (rear) or air outlet (front) of heater.
- **Warning to New York City Residents**

  For Use Only At Construction Sites in accordance with applicable NYC codes under NYCFD certificate of approval #4803, #4899, #4908, #4909, or #4934.

PRODUCT IDENTIFICATION

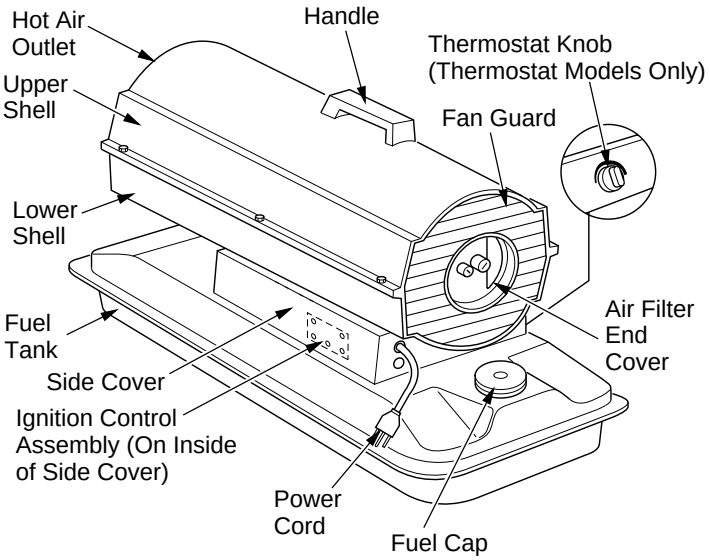


Figure 1 - 40/55/60/70 Models

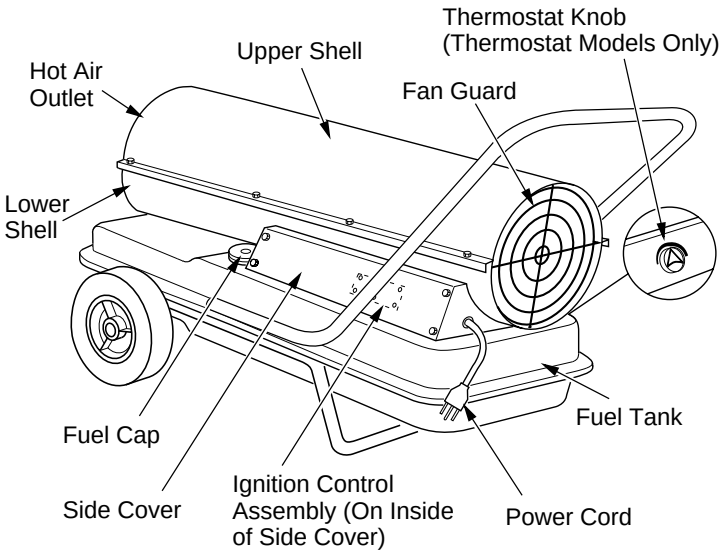


Figure 3 - 200 Model

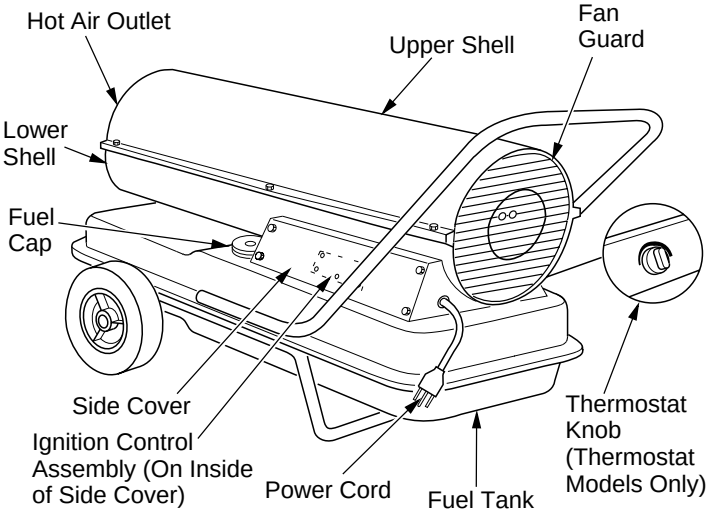


Figure 2 - 110/115/155/165 Models

UNPACKING

1. Remove all packing items applied to heater for shipment.
2. Remove all items from carton.
3. Check items for any shipping damage. If heater is damaged, promptly inform dealer where you bought heater.

THEORY OF OPERATION

The Fuel System: The air pump forces air through the air line. The air is then pushed through the nozzle. This air causes fuel to be lifted from the tank. A fine mist of fuel is sprayed into the combustion chamber.

The Air System: The motor turns the fan. The fan pushes air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

The Ignition System: The ignition control assembly provides power to the ignitor. This ignites the fuel/air mixture in the combustion chamber.

The Flame-Out Control System: This system causes the heater to shut down if the flame goes out.

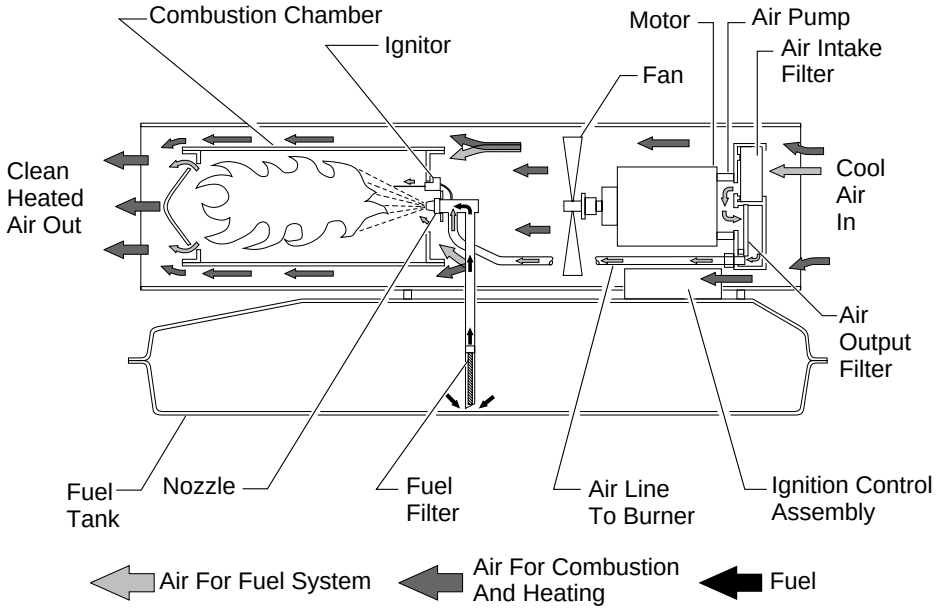


Figure 4 - Cross Section Operational View

FUELS

⚠ WARNING: Use only kerosene, #1/#2 diesel/fuel oil, JET A or JP-8 fuels to avoid risk of fire or explosion. Never use gasoline, oil drained from crankcases, naphtha, paint thinners, alcohol or other highly flammable fuels.

Use only kerosene, #1/#2 diesel/fuel oil, JET A or JP-8 fuels. Heavier fuels such as No. 2 fuel oil or No. 2 diesel fuel may also be used but will result in:

- noticeable odor
- additional fuel filter maintenance
- the need for nontoxic, anti-icer additives in very cold weather

Do not use fuels heavier than No. 2 grade or heavy oils such as oil drained from crankcases. These heavy oils will not ignite properly and will contaminate the heater.

IMPORTANT: Use a KEROSENE ONLY (blue) or DIESEL ONLY (yellow) storage container. Be sure storage container is clean. Foreign matter such as rust, dirt, or water will cause the ignition control assembly to shut down heater. Foreign matter may also require heater's fuel system to be frequently cleaned.

VENTILATION

⚠ WARNING: Provide a fresh air opening of at least three square feet (2,800 square cm) for each 100,000 Btu/hr rating. Provide extra fresh air if more heaters are being used. The minimum ventilation requirements must be followed to avoid risks associated with carbon monoxide poisoning. Make certain these requirements are met prior to operating heater.

Example: A 58.6kw (200,000 Btu/Hr) heater requires one of the following:

- a two-car garage door [4.88 meter (16 feet) opening] raised 12.7 cm (5 inches)
- a single-car garage door [2.74 meter (9 feet) opening] raised 20.3 cm (8 inches)
- two, 76.2 cm (30 inch) windows raised 38.1 cm (15 inches)

ASSEMBLY

(FOR 110/115/155/165/200 MODELS ONLY)

These models are furnished with wheels and a rear handle. Some models are furnished with a front handle also. Wheels, handle(s), and the mounting hardware are found in the shipping carton.

Tools Needed

- Medium Phillips Screwdriver
- 3/8" Open or Adjustable Wrench
- Hammer

1. Slide axle through wheel support frame. Install wheels on axle.

   IMPORTANT: When installing wheels, point extended hub of wheels toward wheel support frame (see Figure 5).
2. Place cap nuts on axle ends. Gently tap with hammer to secure.
3. Place heater on wheel support frame. Make sure hot air outlet end (front) of heater is over wheels. Line up holes on fuel tank flange with holes on wheel support frame.
4. Place rear handle (and front handle if provided) on top of fuel tank flange. Insert screws through handle(s), fuel tank flange, and wheel support frame. Attach nut finger tight after each screw is inserted.
5. After all screws are inserted, tighten nuts firmly.

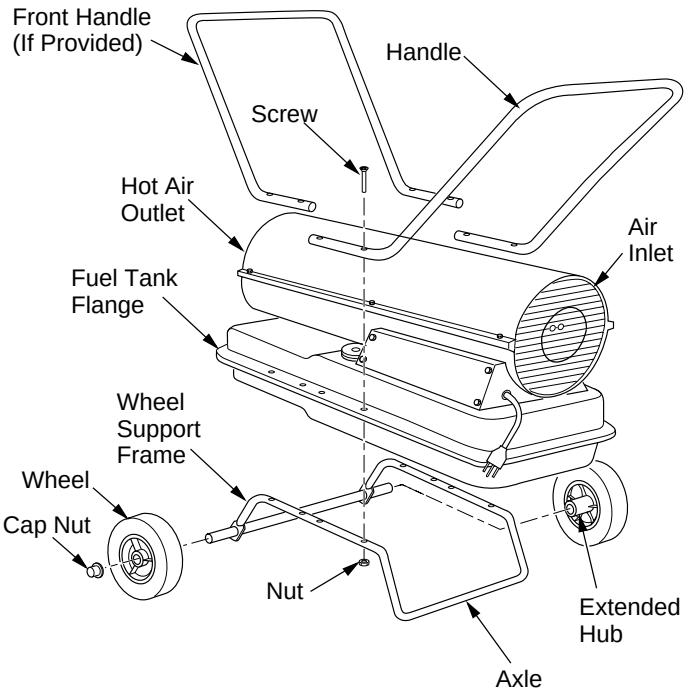


Figure 5 - Wheel and Handle Assembly, 110/115/155/165/200 Models Only

OPERATION

IMPORTANT: Review and understand the warnings in the *Safety Information* section, page 2. They are needed to safely operate this heater. Follow all local ordinances and codes when using this heater.

TO START HEATER

1. Follow all ventilation and safety information.
2. Locate heater to provide maximum circulation of the heated air. Follow all location requirements noted in *Safety Information*, page 2.
3. Fill fuel tank with kerosene, #1#2 diesel/fuel oil, JET A or JP-8 fuel.
4. Attach fuel cap.
5. For thermostat models, turn thermostat knob clockwise to the high position.
6. Plug heater's power cord into approved, grounded, three-wire extension cord. Extension cord must be at least six feet (1.8 meters) long.

   Extension Cord Size Requirement

   6 to 10 feet (1.8 to 3 meters) long, use 18 AWG (0.75 mm^2) rated cord

   11 to 100 feet (3.3 to 30.5 meters) long, use 16 AWG (1.0 mm^2) rated cord

   101 to 200 feet (30.8 to 61 meters) long, use 14 AWG (1.5 mm^2) rated cord
7. Plug extension cord into standard 120 volt/60 hertz, 3-prong grounded outlet. *Note:* Ignitor will preheat for five seconds, then heater will start.
8. For thermostat models, adjust thermostat knob to the desired setting. *Note:* A cold heater may affect the thermostat setting. This thermostat is a general-heating control. It is not intended for precise temperature control. Adjust thermostat until heater cycles at the desired setting.

TO STOP HEATER

Unplug extension cord from outlet.

TO RESTART HEATER

1. Unplug extension cord from outlet and wait 10 seconds. (Wait two minutes if heater has been running.)
2. Repeat steps under *To Start Heater*.

OPERATION WITH PORTABLE GENERATOR

⚠ WARNING: Before operating heater or any appliance from a portable generator, verify that generator has been properly connected to earth ground. Improper grounding or failure to ground generator can result in electrocution if a ground fault occurs. Refer to owner's manual supplied by generator manufacturer for proper grounding procedures.

The operating voltage range of the heater is 108 to 132 Volts (120 Volts +/- 10%). Prior to plugging heater into generator the output voltage should be verified (if generator is equipped with the automatic idle feature, the output voltage should be measured with the generator running at full speed). If the voltage does not measure in this range the heater should not be plugged into the generator.

Refer to *Operation*, page 5, for starting, stopping, and resetting heater procedures.

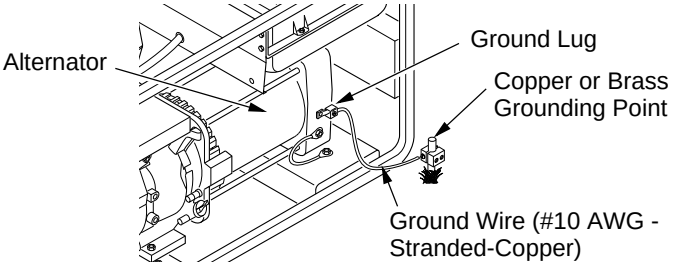


Figure 6 - Typical Generator Grounding Method (Generator construction may vary from that shown)

STORING, TRANSPORTING, OR SHIPPING

Note: If shipping, transport companies require fuel tanks to be empty.

1. Drain fuel tank.

   Note: Some models have drain plug on underside of fuel tank. If so, remove drain plug to drain all fuel. If heater does not have drain plug, drain fuel through fuel cap opening. Be sure all fuel is removed.
2. Replace drain plug if provided.
3. If any debris is noted in old fuel, add 1 or 2 quarts of clean kerosene to tank, stir, and drain again. This will prevent excess debris from clogging filters during future use.
4. Replace fuel cap or drain plug. Properly dispose of old and dirty fuel. Check with local automotive service stations that recycle oil.
5. If storing, store heater in dry place. Make sure storage place is free of dust and corrosive fumes.

IMPORTANT: Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

PREVENTATIVE MAINTENANCE SCHEDULE

⚠ WARNING: Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

Item	How Often	How To
Fuel tank	Flush every 150-200 hours of operation or as needed	See *Storing, Transporting, or Shipping*, above
Air output and lint filters	Replace every 500 hours of operation or once a year	See *Air Output, Air Intake, and Lint Filters*, page 8
Air intake filter	Wash and dry with soap and water every 500 hours of operation or as needed	See *Air Output, Air Intake, and Lint Filters*, page 8
Fuel filter	Clean twice a heating season or as needed	See *Fuel Filter*, pages 9 and 10
Ignitor	No maintenance required	
Fan blades	Clean every season or as needed	See *Fan*, page 8
Motor	Not required/permanently lubricated	

TROUBLESHOOTING

⚠ WARNING: Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

FAULT CONDITION	POSSIBLE CAUSE	REMEDY
Motor does not start five seconds after heater is plugged in	1. No power to heater	1. Check circuit breaker in electrical panel
	2. If equipped, thermostat setting is too low	2. Turn thermostat knob to a higher setting
	⚠ WARNING: High voltage!	
	3. Bad electrical connection between motor and ignition control assembly or ignition control assembly and power cord	3. Check all electrical connections. See *Wiring Diagrams*, pages 16 and 17
	4. Binding pump rotor	4. If fan does not turn freely, see *Pump Rotor,* page 14
	5. Defective ignition control assembly	5. Replace ignition control assembly
	6. Defective motor	6. Replace motor
	7. Blown fuse or ignitor control assembly	7. See *Ignition Control Assembly*, page 15
Motor starts and runs but heater does not ignite	1. No fuel in tank	1. Fill tank with kerosene
	2. Pump pressure incorrect	2. See *Pump Pressure Adjustment,* page 9
	3. Dirty fuel filter	3. See *Fuel Filter,* pages 9 and 10
	4. Obstruction in nozzle	4. See *Nozzle Assembly,* pages 12 and 13
	5. Water in fuel tank	5. Drain and flush fuel tank with clean kerosene. See *Storing, Transporting, or Shipping,* page 6
	⚠ WARNING: High voltage!	
	6. Bad electrical connection between ignitor and ignition control assembly	6. Check electrical connections. See *Wiring Diagrams,* pages 16 and 17
	7. Defective ignitor	7. Replace ignitor, see page 11
	8. Defective ignition control assembly	8. Replace ignition control assembly
	9. 200 Model Only: Defective fuel valve (Models equipped with fuel valve only)	9. See *Fuel Valve*, page 10
Heater ignites but ignition control assembly shuts heater off after a short period of time	1. Pump pressure incorrect	1. See *Pump Pressure Adjustment,* page 9
	2. Dirty air intake, air output, and/or lint filter	2. See *Air Output, Air Intake, and Lint Filters,* page 8
	3. Dirty fuel filter	3. See *Fuel Filter,* pages 9 and 10
	4. Obstruction in nozzle	4. See *Nozzle Assembly,* pages 12 and 13
	5. Photocell assembly not properly installed (not seeing the flame)	5. Make sure photocell boot is properly seated in bracket
	6. Dirty photocell lens	6. Clean photocell lens
	⚠ WARNING: High voltage!	
	7. Bad electrical connection between photocell and ignition control assembly	7. Check electrical connections. See *Wiring Diagrams,* pages 16 and 17
	8. Defective photocell	8. Replace photocell
	9. Defective ignition control assembly	9. Replace ignition control assembly

SERVICE PROCEDURES

⚠ WARNING: To avoid risk of burn and electrical shock, never attempt to service heater while it is plugged in, operating, or hot.

UPPER SHELL REMOVAL

1. Remove screws along each side of heater using 5/16" nut-driver. These screws attach upper and lower shells together. See Figure 7 or 8.
2. Lift upper shell off.
3. Remove fan guard.

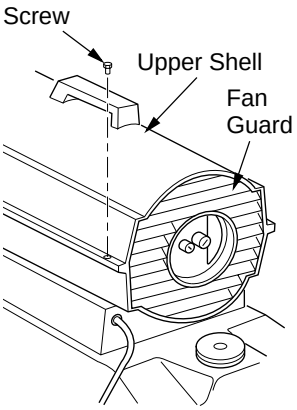


Figure 7 - Upper Shell Removal, 40/50/60/70 Models Only

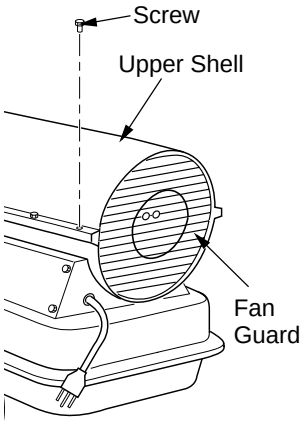


Figure 8 - Upper Shell Removal, 110/115/155/165/200 Models Only

FAN

IMPORTANT: Remove fan from motor shaft before removing motor from heater. The weight of the motor resting on the fan could damage the fan pitch (see Figure 9).

1. Remove upper shell (see Figure 7 or 8).
2. Use 1/8" allen wrench to loosen setscrew which holds fan to motor shaft.
3. Slip fan off motor shaft.
4. Clean fan using a soft cloth moistened with kerosene or solvent.
5. Dry fan thoroughly.
6. Replace fan on motor shaft. Place fan hub flush with end of motor shaft (see Figure 10).
7. Place setscrew on flat of shaft. Tighten setscrew firmly (40-50 inch-pounds/4.5-5.6 n-m).
8. Replace fan guard and upper shell.

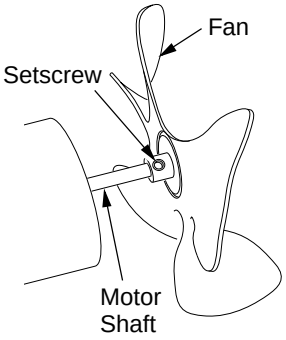


Figure 9 - Fan, Motor Shaft, and Setscrew Location

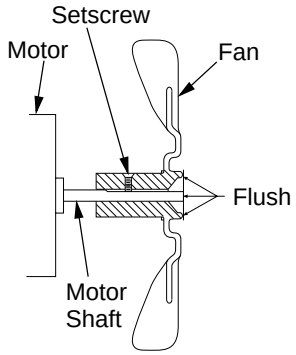


Figure 10 - Fan Cross Section

AIR OUTPUT, AIR INTAKE AND LINT FILTERS

1. Remove upper shell (see Figure 7 or 8).
2. Remove filter end cover screws using 5/16" nut-driver (see Figure 11 or 12).
3. Remove filter end cover.
4. Replace air output and lint filters.
5. Wash or replace air intake filter (see *Preventative Maintenance Schedule*, page 6).
6. Replace filter end cover.
7. Replace fan guard and upper shell.

IMPORTANT: Do not oil filters.

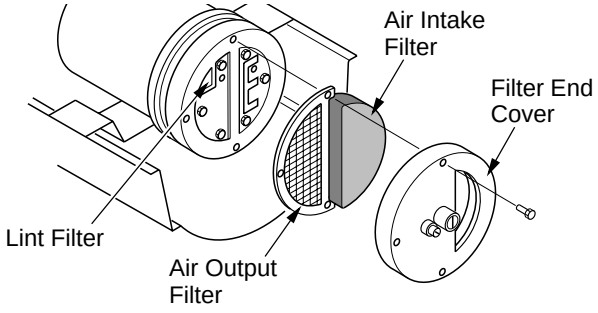


Figure 11 - Air Output, Air Intake, and Lint Filters, 40/55/60/70 Models Only

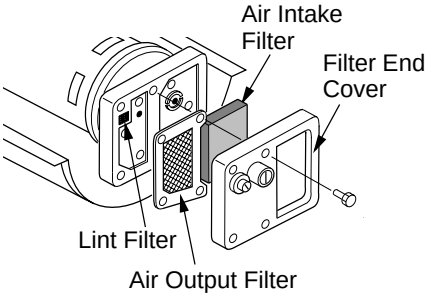


Figure 12 - Air Output, Air Intake, and Lint Filters, 110/115/155/165/200 Models Only

SERVICE PROCEDURES
Continued

PUMP PRESSURE ADJUSTMENT

1. Remove pressure gauge plug from filter end cover (see Figure 13).
2. Install accessory pressure gauge (part number HA1180).
3. Start heater (see *Operation*, page 5). Allow motor to reach full speed.
4. Adjust pressure. Turn relief valve to right to increase pressure. Turn relief valve to left to decrease pressure. See specifications correct pressure for each model (see Figure 14).
5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.

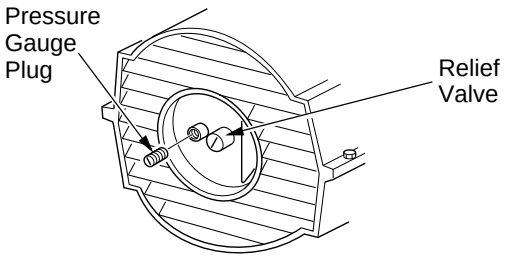


Figure 13 - Pressure Gauge Plug Removal (40/55/60/70 Models Shown)

Model	Pump Pressure
40	3.0 PSI
55	3.4 PSI
60	3.4 PSI
70	4.7 PSI
110	5.1 PSI
115	5.1 PSI
155	5.2 PSI
165	5.6 PSI
200	6.2 PSI

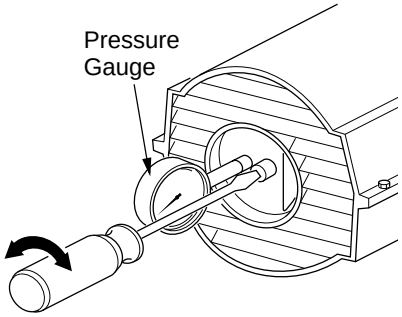


Figure 14 - Adjusting Pump Pressure (40/55/60/70 Models Shown)

FUEL FILTER
(For 40/55/60/70/110/115/155/165 Models Only)

1. Remove side cover screws using 5/16" nut-driver.
2. Remove side cover.
3. Pull upper fuel line off fuel filter neck (see Figure 15 or 16).
4. Carefully pry bushing, fuel filter, and lower fuel line (110/115/155/165 Models only) out of fuel tank (see Figure 16).
5. Wash fuel filter with clean fuel and replace in tank.
6. Attach upper fuel line to fuel filter neck.
7. Replace side cover.

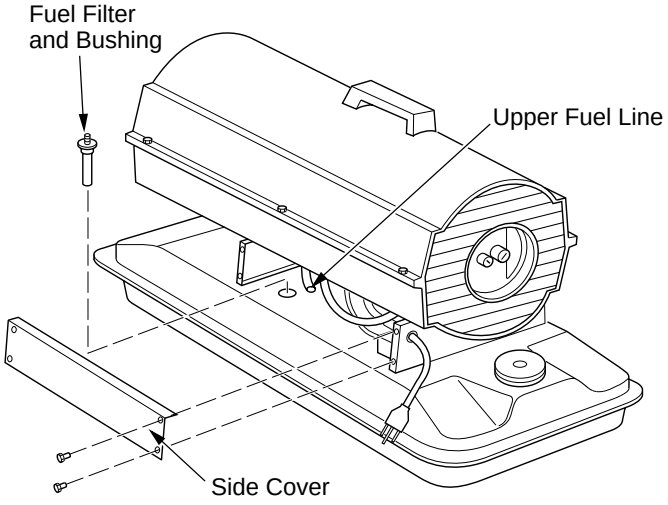


Figure 15 - Fuel Filter Removal, 40/55/60/70 Models

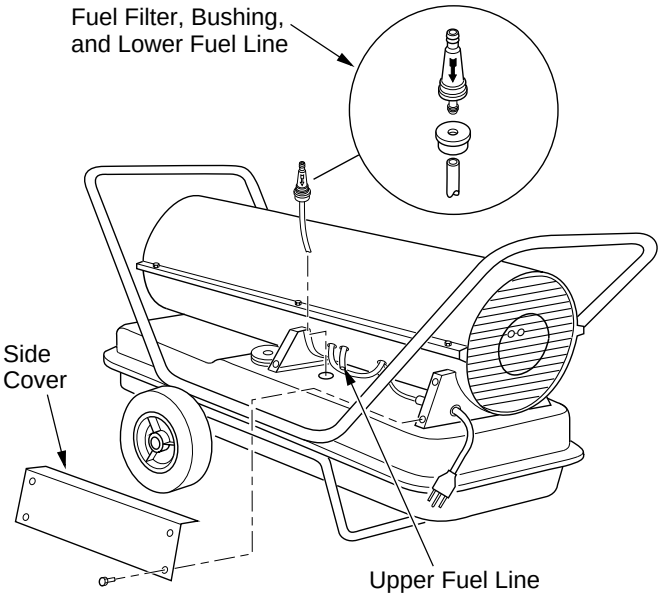


Figure 16 - Fuel Filter Removal, 110/115/155/165 Models

SERVICE PROCEDURES
Continued

(For 200 Model Only)

1. Remove side cover screws using 5/16" nut-driver.
2. Remove side cover (see Figure 17).
3. Pull lower fuel line off the fuel valve fitting (see Figure 17).

   Note: See Figure 16, page 9 if your model does not come equipped with a fuel valve.
4. Carefully pry bushing, lower fuel line, and fuel filter out of fuel tank.
5. Wash fuel filter with clean fuel and replace in tank.
6. Attach lower fuel line to fuel valve fitting.
7. Replace side cover.

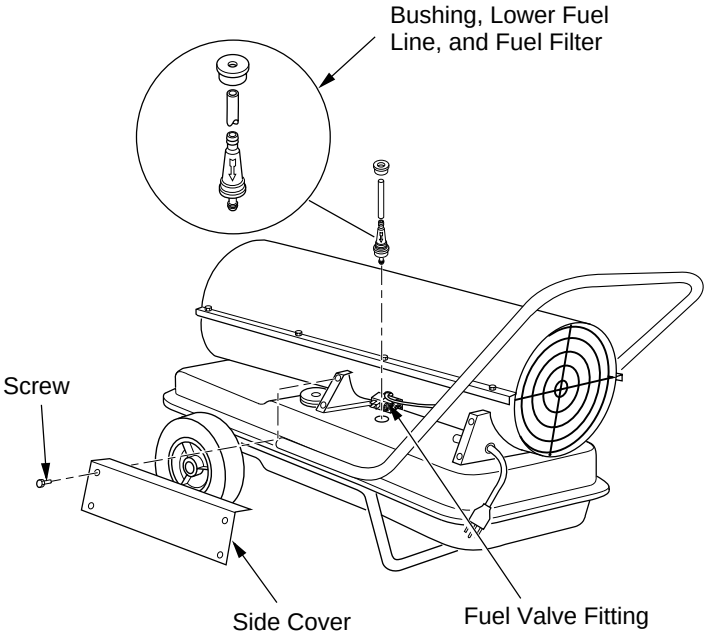


Figure 17 - Fuel Filter Removal, 200 Model Only (Model with Fuel Valve Assembly Shown)

FUEL VALVE

For 200 Models Equipped with Fuel Valve

1. Remove side cover (see Figure 17), fan guard, and upper shell (see Figure 8, page 8) screws using 5/16" nut-driver.
2. Remove fan (see *Fan*, page 8).
3. Pull lower fuel line off the fuel valve fitting (see Figure 18).

⚠ WARNING: High Voltage

4. Disconnect red and white wires from fuel valve (see Figure 18).
5. Using 1/4" nut driver remove 2 screws holding fuel valve and bracket to lower shell (see Figure 18). Save these screws.
6. Using 1/4" nut driver remove 2 screws holding fuel valve to bracket. Save these screws.
7. Attach new fuel valve to bracket with 2 screws.
8. Install new fuel valve and bracket on lower shell with 2 screws.
9. Connect red and white wires (polarity not important). Connect upper and lower fuel lines to fuel valve (see Figure 18).
10. Replace fan, fan guard, upper shell, and side cover.

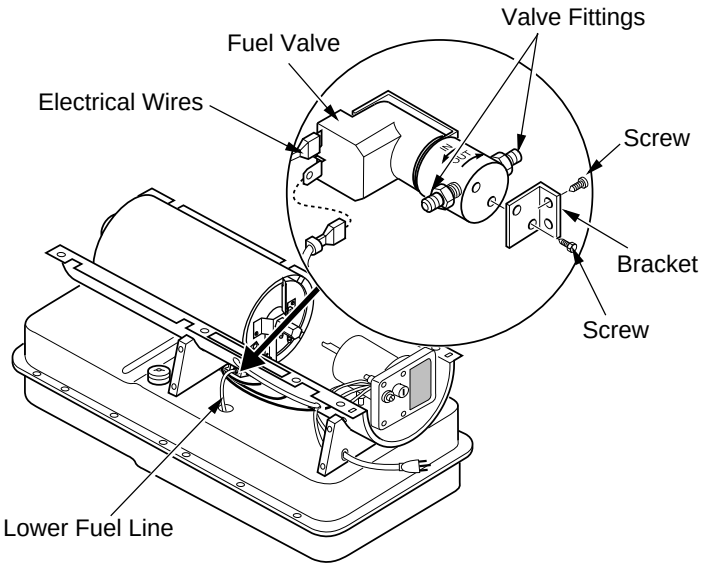


Figure 18 - Fuel Valve Replacement, 200 Model Only

SERVICE PROCEDURES
Continued

IGNITOR

1. Remove upper shell and fan guard (See *Upper Shell Removal*, page 8).
2. Remove fan (see page 8).
3. Remove 4 side cover screws with a 5/16" nut driver. Remove side cover (see Figures 15 or 16, page 9 or Figure 17, page 10).
4. Disconnect ignitor wires from ignition control assembly (see Figure 19). Pull the ignitor wires up through the hole in the lower shell.
5. Disconnect fuel line hose and air line hose. Remove photocell from photocell bracket (see Figure 19).
6. Remove combustion chamber. Stand combustion chamber on end with nozzle adapter bracket on top (see Figure 20).
7. Remove ignitor screw with a 1/4" nut driver. Carefully remove ignitor from nozzle adapter bracket.

⚠ CAUTION: Do not bend or strike ignitor element. Handle with care.

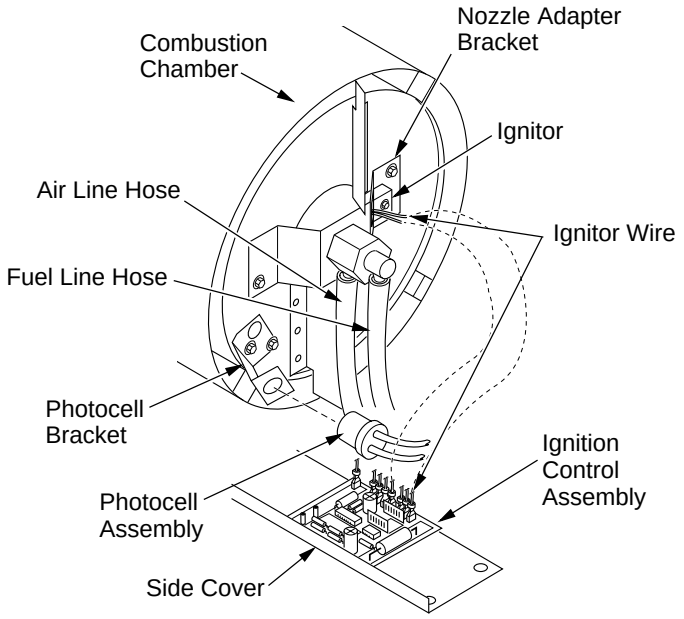


Figure 19 - Disconnecting Ignitor Wires from Ignition Control Assembly (40/55/60/70/110/115/155/165 Models Shown)

8. Carefully remove replacement ignitor from styrofoam packing.
9. Carefully guide ignitor into opening in nozzle adapter bracket. Do not strike ignitor element. Attach ignitor to nozzle adapter bracket with screw using a 1/4" nut driver (see Figure 20). Torque .90 to 1.69 N-m (8 to 15 in-lbs) Do not over torque.
10. Replace combustion chamber.
11. Route the ignitor wires back down through the hole in the lower shell. Connect wires to the ignition control assembly (see Figure 19).
12. Replace side cover (see Figures 15 or 16, page 9 or Figure 17, page 9).
13. Connect and route fuel line hose and air line hose to nozzle adapter assembly. See *Fuel and Air Line Replacement and Proper Routing*, page 13.
14. Replace photocell in photocell bracket. Route wires as shown in either (see Figures 21 or 22, page 12 or Figure 25, page 13).
15. Replace fan (see page 8).
16. Replace fan guard and upper shell (see page 8).

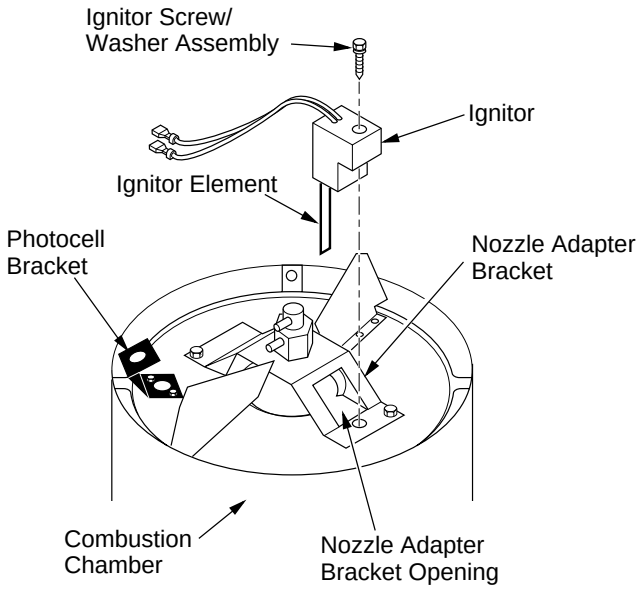


Figure 20 - Ignitor Replacement

SERVICE PROCEDURES
Continued

NOZZLE ASSEMBLY

(For 40/55/60/70/110/115/155/165 Models Only)

1. Remove upper shell (see *Upper Shell Removal*, page 8).
2. Remove fan (see *Fan*, page 8).
3. Remove fuel and air line hoses from nozzle assembly (see Figure 21 or 22).
4. Turn nozzle assembly 1/4 turn to left and pull toward motor to remove (see Figure 23).
5. Place plastic hex-body into vise and lightly tighten.
6. Carefully remove nozzle from the nozzle adapter using 5/8" socket wrench (see Figure 24).
7. Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
8. Inspect nozzle sleeve for damage.
9. Replace nozzle into nozzle adapter until nozzle seats. Tighten 1/3 turn more using 5/8" socket wrench 4.5 to 5.1 N-m (40 to 45 in-lbs). See Figure 24.
10. Attach nozzle assembly to burner strap (see Figure 23).
11. Attach fuel and airline hoses to nozzle assembly. See *Fuel and Airline Replacement and Proper Routing*, page 13.
12. Replace fan (see *Fan*, page 8).
13. Replace fan guard and upper shell (see *Upper Shell Removal*, page 8).

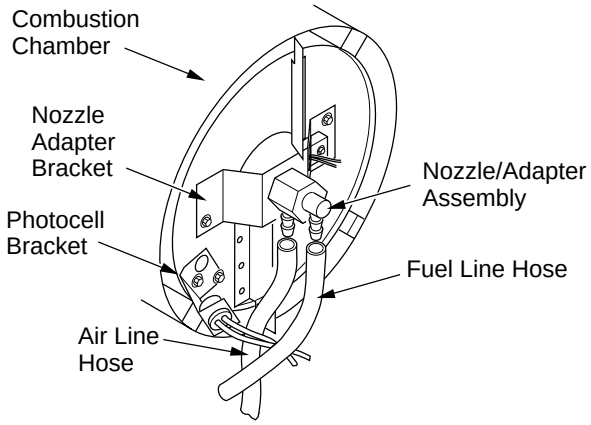


Figure 21 - Removing Air and Fuel Line Hoses (40/55/60/70 Models Only)

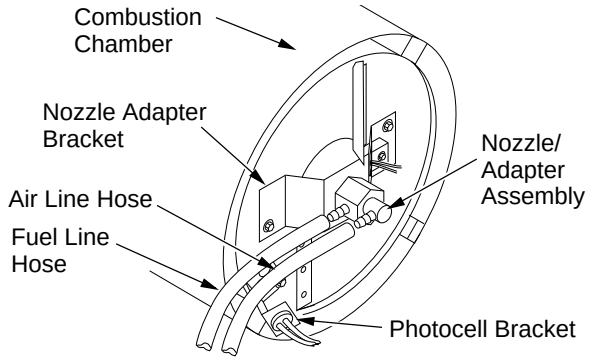


Figure 22 - Removing Air and Fuel Line Hoses (110/115/155/165 Models Only)

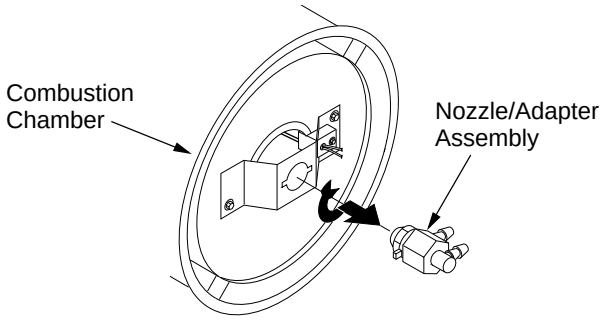


Figure 23 - Removing Nozzle/Adapter Assembly

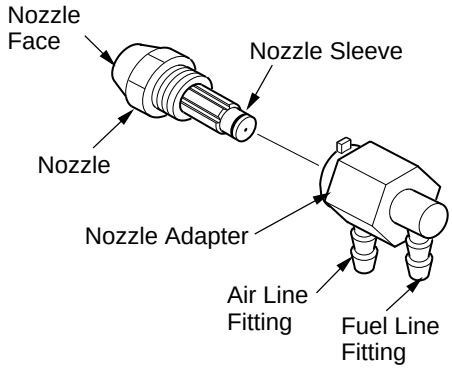


Figure 24 - Nozzle and Nozzle Adapter

SERVICE PROCEDURES
Continued

(For 200 Model Only)

1. Remove combustion chamber and ignitor by following steps 1 through 7 under *Ignitor*, page 11.
2. Carefully place the ignitor in a safe location.
3. Remove two nozzle adapter bracket screws (see Figure 25).
4. Place hex-shaped aluminum nozzle adapter into vise (do not overtighten).
5. Carefully remove nozzle from nozzle adapter using 5/8" socket wrench (see Figure 26).
6. Blow compressed air through face of nozzle. This will remove any debris in nozzle.
7. Inspect nozzle seal for damage.
8. Replace nozzle into nozzle adapter until nozzle seats. Tighten 80-110 inch-pounds.
9. Attach nozzle adapter bracket to combustion chamber with two screws removed in step 3.
10. Repeat steps 9 through 16 under *Ignitor*, page 11.

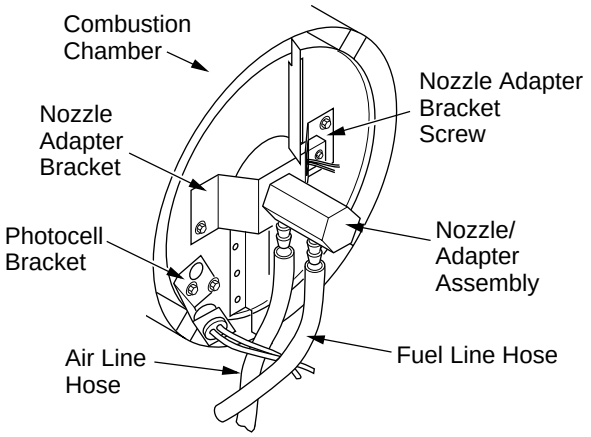


Figure 25 - Removing Air and Fuel Line Hoses (200 Model Only)

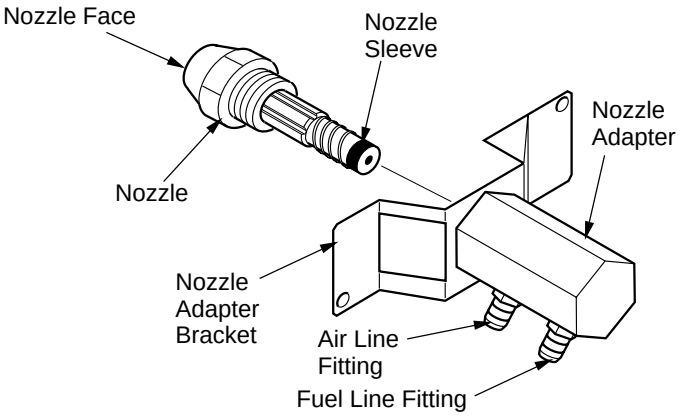


Figure 26 - Nozzle and Nozzle Adapter

FUEL AND AIR LINE REPLACEMENT AND PROPER ROUTING

1. Remove upper shell (see *Upper Shell Removal*, page 8).
2. Remove side cover screws using 5/16" nut driver (see Figure 15 or 16, page 9 or Figure 17, page 10).
3. Remove side cover.
4. Inspect fuel and air line hoses for cracks and/or holes. If fuel line hose is damaged, disconnect from nozzle adapter (see Figure 21 or 22, page 12, or Figure 25) and from fuel filter (see *Fuel Filter*, pages 9 and 10). If air line hose is damaged, disconnect from nozzle adapter (see Figure 21 or 22, page 12, or Figure 25) and from barb fitting on pump end cover (see Figure 27).
5. Install new air and/or fuel line. Attach one end of air line hose to barb fitting on pump end cover (see Figure 27) and the other end to nozzle adapter (see Figure 21 or 22, page 12, or Figure 25). Attach one end of fuel line hose to fuel filter (see *Fuel Filter*, pages 9 and 10) and the other end to nozzle adapter (see Figure 21 or 22, page 12, or Figure 25).

   Note: Route hoses as shown in see Figure 21 or 22, page 12, or Figure 25, according to model. Hoses are not to touch photocell bracket.
6. Replace side cover.
7. Replace upper shell and fan guard (see *Upper Shell Removal*, page 8).

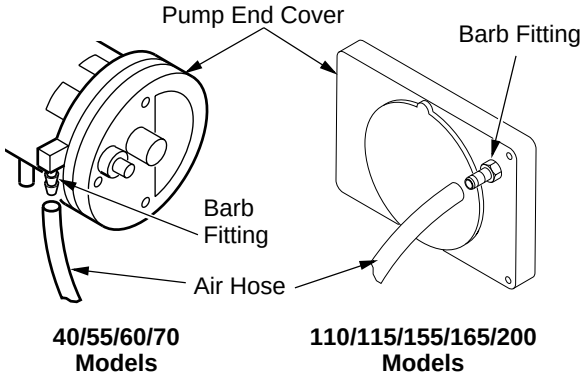


Figure 27 - Air Hose to Barb Fitting

SERVICE PROCEDURES
Continued

PUMP ROTOR
(Procedure if Rotor is Binding)

1. Remove upper shell (see *Upper Shell Removal*, page 8).
2. Remove filter end cover screws using 5/16" nut driver (see Figure 28 or 29).
3. Remove filter end cover and air filters.
4. Remove pump plate screws using 5/16" nut-driver.
5. Remove pump plate.
6. Remove rotor, insert, and blades (see Figure 28 or 29).
7. Check for debris in pump. If debris is found, blow out with compressed air.
8. Install insert and rotor.
9. Check gap on rotor. Adjust to .076/.101 mm (.003"/.004") if needed (see Figure 30).

   Note: Rotate rotor one full turn to ensure the gap is .076/.101 mm (.003"/.004") at tightest position. Adjust if needed.
10. Install blades, pump plate, air filters, and filter end cover.
11. Replace fan guard and upper shell (see *Upper Shell Removal*, page 8).
12. Adjust pump pressure (see *Pump Pressure Adjustment*, page 9).

    Note: If rotor is still binding, proceed as follows.
13. Perform steps 1 through 6.
14. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in “figure 8” motion four times (see Figure 31).
15. Reinstall insert and rotor.
16. Perform steps 10 through 12.

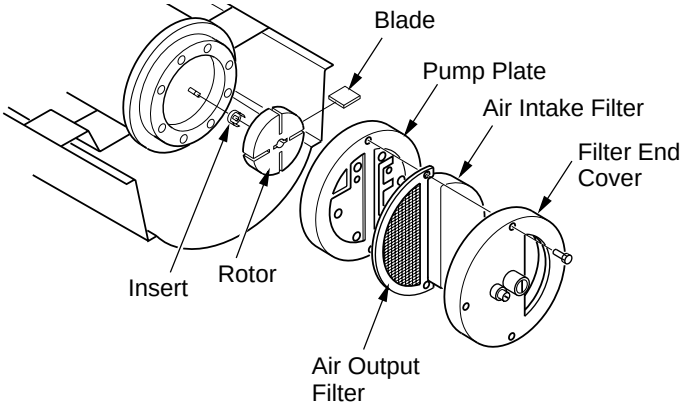


Figure 28 - Rotor Location, 40/55/60/70 Models

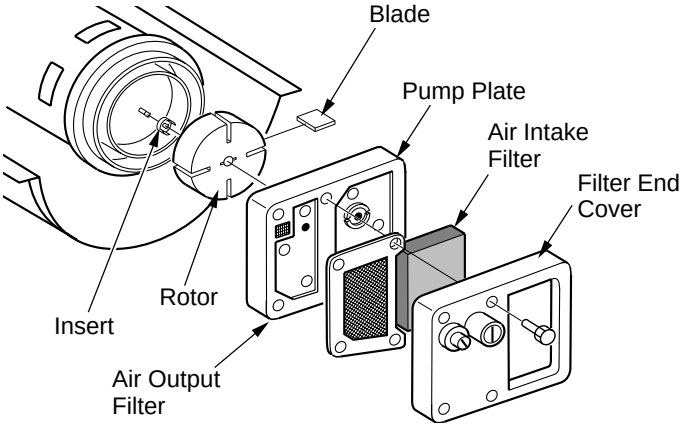


Figure 29 - Rotor Location, 110/115/155/165/200 Models

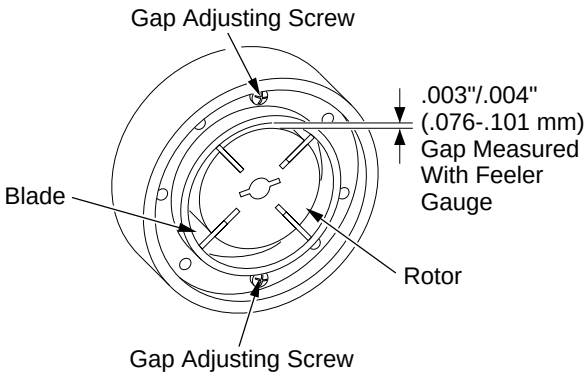


Figure 30 - Gap Adjusting Screw Locations

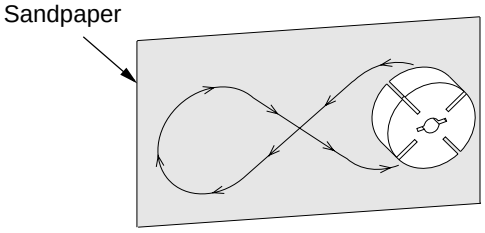


Figure 31 - Sanding Rotor

SERVICE PROCEDURES

Continued

IGNITION CONTROL ASSEMBLY

⚠ WARNING: High voltage!

1. Unplug heater.
2. Remove side cover screws (4) using 5/16" nut-driver to expose ignition control assembly.
3. Remove fuse cover (see Figure 32).
4. Remove fuse from fuse clips (see Figure 32).
5. Replace fuse with fuse of the same type and rating (GMA-10). Do not substitute a fuse with a higher current rating.
6. Replace fuse cover (see Figure 32).
7. Replace side cover (see Figures 15 or 16, page 9 or Figure 17, page 10).

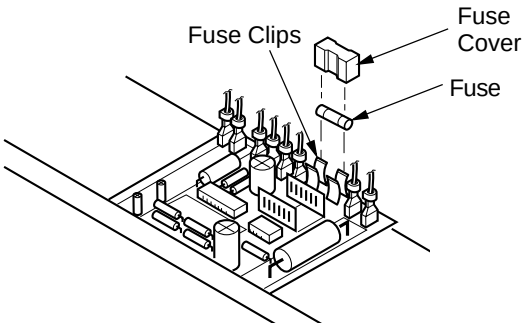


Figure 32 - Replacing Fuse

TECHNICAL SERVICE

You may have further questions about installation, operation, or troubleshooting. If so, contact DESA Heating Products' Technical Service Department at 1-866-672-6040. When calling please have your model and serial numbers of your heater ready.

You can also visit DESA Heating Products' technical services web site at **www.desatech.com.**

REPLACEMENT PARTS

Note: Use only original replacement parts. This will protect your warranty coverage for parts replaced under warranty.

PARTS UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA Heating Products' Technical Service Dept. at 1-866-672-6040.

When calling DESA Heating Products, have ready:

- your name
- your address
- model and serial numbers of your heater
- how heater was malfunctioning
- purchase date

Usually, we will ask you to return the part to the factory.

PARTS NOT UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA Heating Products at 1-866-672-6040 for referral information. Parts dealers are listed in the Authorized Service Center booklet supplied with heater.

When calling DESA Heating Products, have ready:

- model and serial numbers of your heater
- the replacement part number

OWNER'S REGISTRATION FORM

Complete registration form and mail or complete on-line registration at **www.desatech.com** within 30 days after purchase.

Brand: _____ (Reddy Heater, Master, Remington, etc.)

Model: _____ (R60, HD15, etc.)

Date Purchased: _____ *Note:* Keep receipt for warranty verification.

Serial Number: _____ 7 or 9 digit number located on product or identification tag.

First Name: _____ Last Name: _____

Address: _____

City: _____ State: _____ Zip: _____ Country: _____

Phone: (_____)_____-_____ E-Mail: _____

Please answer the following questions to register your product with DESA Heating Products:

1. Who will heater be used by? ❍ Individual ❍ Business
2. Will you use your heater in more than one location? ❍ Yes ❍ No
3. Where will the product be used? (You may select more than one.) ❍ Workshop ❍ Barn ❍ Residential Construction
   ❍ Commercial Construction ❍ Garage ❍ Factory ❍ Recreation ❍ Warehouse ❍ Utility Shed/Outbuilding
   ❍ Other _____ (Specify)
4. Cost of product (excluding sales tax)? $_____
5. Maintenance/service work will be performed by: ❍ Self ❍ Service Center ❍ Other _____
6. If you bought this product yourself, did you plan to purchase this type of product before going into the store? ❍ Yes ❍ No
7. Type of store where product was purchased? ❍ Hardware ❍ Propane Dealer ❍ Natural Gas/Utility Co. ❍ Home Center or Builder's Supply
   ❍ Farm/Ag. Supply ❍ Auto Parts ❍ Warehouse Club ❍ Industrial/Contractor Supply ❍ Rental Store
   ❍ Discount Store ❍ HVAC Dealer ❍ Other _____
8. What is your primary source of heat? ❍ Propane (LP Gas) ❍ Natural Gas ❍ Kerosene ❍ Diesel ❍ Electric ❍ Other_____
9. What motivated you to buy this product? ❍ Sudden Cold Weather ❍ Replace Older Model ❍ D.I.Y. Home Project ❍ Emergency Back-Up Heat
   ❍ Heater on Sale ❍ Construction Project ❍ Hard to Heat Location ❍ Other _____
10. How did you learn about this product brand? ❍ Advertisement ❍ Relative or Friend ❍ Co-Worker ❍ Store Representative
    ❍ Store Display ❍ Previously Owned a Heater ❍ Other _____(Specify)
11. What other brands did you consider? ❍ None ❍ Master ❍ Remington ❍ All-Pro ❍ Dayton ❍ Universal ❍ Mr. Heater ❍ L.B. White Tradesman
    ❍ John Deere ❍ Dyna-Glo ❍ Dura-Heat ❍ Paulin ❍ Coleman ❍ Vogelzang American ❍ Other _____
12. Who selected the product? ❍ Male ❍ Female ❍ Both
13. Level of Education of Purchaser: ❍ High School ❍ Vocation/Technical School ❍ Some College ❍ Completed College ❍ Graduate School
14. Age of Purchaser: ❍ Under 20 ❍ 20 - 29 ❍ 30 - 39 ❍ 40 - 49 ❍ 50 - 59 ❍ 60 or Over
15. Buyer's total annual household income: ❍ Under $19,999 ❍ $20,000 to $34,999 ❍ $35,000 to $49,999
    ❍ $50,000 to $74,999 ❍ $75,000 to $99,999 ❍ $100,000 and Over
16. What is the population of your area? ❍ Under 10,000 ❍ 10,000 to 25,000 ❍ 25,000 to 50,000 ❍ 50,000 to 100,000
    ❍ 100,000 to 250,000 ❍ Over 250,000
17. Store where product was purchased:
    Name: _____ City: _____ State: _____
18. In choosing this product, how important were the following:

	Not	Somewhat	Very		Not	Somewhat	Very
Availability	❍	❍	❍	Size	❍	❍	❍
Price	❍	❍	❍	Prior Brand Experience	❍	❍	❍
Brand Name	❍	❍	❍	Built-In Thermostat	❍	❍	❍
Overall Quality	❍	❍	❍	Ease of Operation	❍	❍	❍
Heat Output (Btu/Hr Rating)	❍	❍	❍	Special Features	❍	❍	❍
Variable Heat Output (Btu/Hr)	❍	❍	❍	Salesperson's Recommendation	❍	❍	❍
Made in USA	❍	❍	❍	Friend/Relative's Recommendation	❍	❍	❍
Warranty	❍	❍	❍	Portability	❍	❍	❍
Local Service	❍	❍	❍	Quiet Operation	❍	❍	❍
Value for Price	❍	❍	❍				

19. This question will allow us to better understand the demographic profile of our customers. Which of the following best describes you? (not required)
    ❍ African American ❍ Asian American ❍ Mexican ❍ Puerto Rican ❍ Cuban ❍ Other Hispanic ❍ White ❍ Other _____

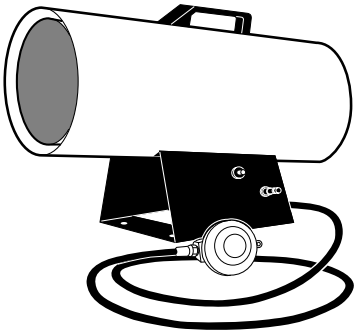
TAPE

Postage
Required

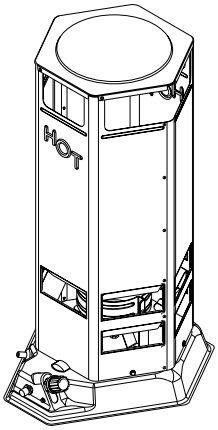
DESA™
HEATING PRODUCTS
2701 Industrial Drive
P.O. Box 90004
Bowling Green, KY 42102-9004

TAPE

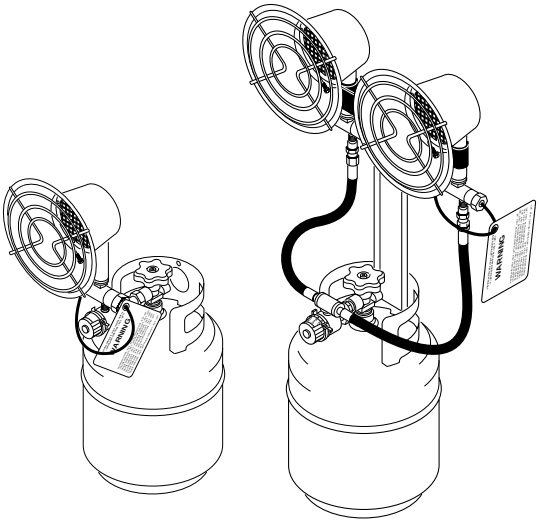
OTHER OUTDOOR HEATING PRODUCTS



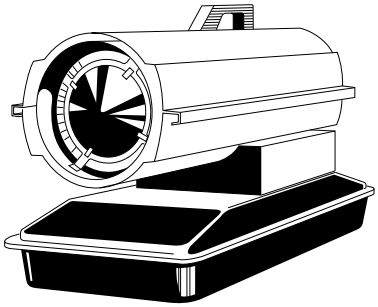
PROPANE/LP FORCED AIR HEATERS



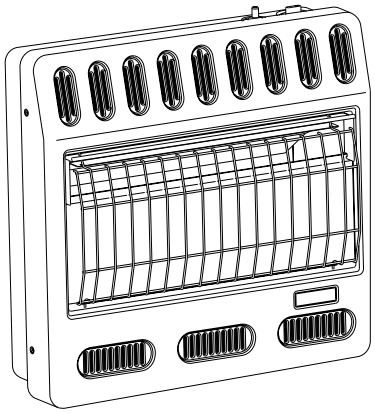
PROPANE/LP CONVECTION HEATERS



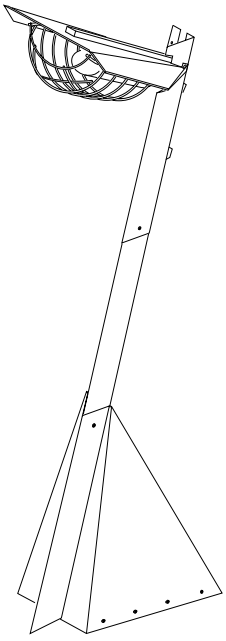
PROPANE/LP TANK TOP HEATERS



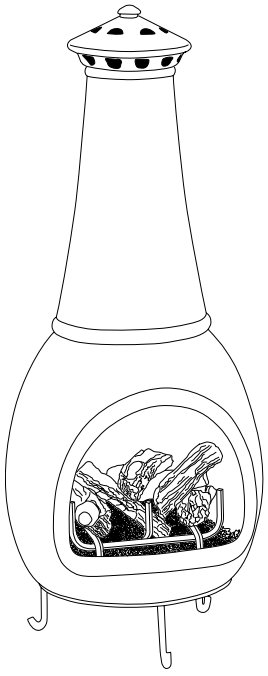
PORTABLE KEROSENE/DIESEL FORCED AIR HEATERS



PROPANE/LP AND NATURAL GAS GARAGE HEATERS



PROPANE/LP PATIO HEATERS



PROPANE/LP AND NATURAL GAS CHIMENEAS

WARRANTY AND REPAIR SERVICE

LIMITED WARRANTY

DESA Heating Products warrants this product and any parts thereof, to be free from defects in materials and workmanship for one (1) year from the date of first purchase when operated and maintained in accordance with instructions. This warranty is extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, normal wear, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DESA Heating Products assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA Heating Products will repair or replace the heater without charge.

REPAIR SERVICE

Return the heater to your nearest authorized service center. Each Service Center is independently owned and operated. Repairs not covered by the warranty will be billed at standard prices. We reserve the right to amend these specifications at any time without notice.

Illustrated parts lists can be obtained free of charge. Send a self addressed stamped envelope to the address listed below. List the heater model number and the date located in the lower right corner of this page. A service manual may be purchased from the address listed below. Send a check for $5.00 payable to DESA Heating Products.

When writing for information regarding your heater, be sure to include the model number and serial number as shown on the model plate.

For more information about this warranty, write:

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HEATING PRODUCTS
2701 Industrial Drive
P.O. Box 90004
Bowling Green, KY 42102-9004
www.desatech.com

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